to newspaper. "Whatever," says Theophrastus, "be the condition of the air at the setting of the Pleiades, such it continues for the most part, until the winter solstice." This would cover practically nine months of the year, if by the setting of the Pleiades is meant the setting with the sun. The moon, too, is either the cause of a change or the prognostication of it. "The change takes place for the most part on the fourth day, and if not then on the first quarter, and if not then at the full." A weather prophet of to-day would be discredited if he hedged in this way. A clear crisp statement is now necessary to secure credence, and attach disciples to the school of the modern weather prophet. As one turns over the pages that give the signs of fair or foul weather, signs all more or less puerile, one is reminded of the saying that Plato has preserved for us, *Ἕλληνες ἀεὶ παῖδές ἐστε.*

We can have no hesitation in asserting that the appendix is the most valuable part of the book. Herein, Mr. Wood has given an excellent account of the gradual changes introduced in the nomenclature and in the subdivision of the winds from the time of Homer and Hesiod, through the Middle Ages, down to the present time. Such an account is not only of great assistance to the correct apprehension of old authors, but gives a great deal of information on the introduction of fresh terms in the description of the winds. Mr. Wood seems distressed as to the exact localisation of a wind that is defined by reference to the azimuth of the sun, at rising or setting at the summer and winter solstice. Of course the azimuth varies with the latitude of the place of observation, but Aristotle, writing for Greeks, described positions as they were seen in Greece. Mr. Wood might as well have taken into account the effect of refraction at the horizon, or the alteration in the obliquity of the ecliptic. In these days, we rarely attempt to determine the direction of the wind within 20°, and it is scarcely likely that greater accuracy was attempted in Greece. But whether Aristotle spoke of the equator or Athens, the whole difference is only about 6°, so that the question of accuracy hardly enters. We congratulate Mr. Wood upon the amount of well-digested information he has been able to give in this chapter.

W. E. P.

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## *TWO BOOKS ON AMERICAN ANTIQUITIES.*

*Travels amongst American Indians, their Ancient Earthworks and Temples; including a Journey in Guatemala, Mexico, and Yucatan, and a visit to the Ruins of Patinamit, Utatlan, Palenque, and Uxmal.* By Vice-Admiral Lindesay Brine. (London: Sampson Low, 1894.)

*Journal of the Academy of Natural Sciences of Philadelphia.* Second series, vol. x. part I. (Philadelphia: Academy of Natural Sciences, 1894.)

ADMIRAL BRINE'S pleasantly written book is the record of a journey made through the United States, Guatemala, and Yucatan in the years 1869–70. It is to be regretted that his notes were not published at once on his return home, as in those days Guatemala and Yucatan were still almost unknown lands, and since that date half a dozen books—few of them, it must be admitted, of great value—have made the country more familiar to us.

The particular object of Admiral Brine's journey was the examination of the earthworks and temples of the American Indians, and the first portion of the book is devoted to the red man and his works. Several months were occupied in examining the mounds and earthworks in Ohio.

On the difficult question of age, the author favours the view that the circular and octagon enclosures are of comparatively late date.

> "But the figure which would have been absolutely impracticable to construct without proper surveying appliances for making accurate measurements, and fixing the true angles, is that of the octagon. Even under the most favourable circumstances, with the help of suitable instruments, it would have required much skill and calculation to trace a true octagon, whose embankments contained within them an area exceeding forty acres. It is difficult to suppose that an accurately designed work of this shape and magnitude could have been planned by Indians, or that the construction of a figure so essentially scientific and unusual, could have been originated by them. It is therefore possible to conclude that the geometrical earthworks in Ohio may have been raised by native tribes, acting under the direction of European surveyors, or men who had received a mathematical education."

Concerning the Indian tribes who actually did the work of raising the embankments, the author adds in a note that—

> "Nothing has been found amongst the ornaments or weapons that were placed in their burial mounds, which supports the hypothesis that they were different in race or intelligence from the tribes that surround them."

From San Francisco, Admiral Brine sailed down the Pacific Coast to Guatemala. He tells a story of Carrera, that remarkable Indian of pure blood, who was for so long the President of the Republic, and of whom mention is often made in "Stephens' Incidents of Travel in Central America."

> "Colonel Garcia told us that Carrera always had on his writing-table a toy representing Louis Philippe with his hat in his hand. This toy had a rounded base, and was so weighted that, when it was touched, it rolled backwards and forwards, and would thus represent Louis Philippe constantly bowing, hat in hand. Carrera when engaged in official work would frequently make the toy move, and then would say to those who stood near him, 'It seems in that way, by too much bowing, that Louis Philippe lost his throne. I shall take care that I do not make the same mistake.'"

A journey in Guatemala in 1870 was by no means as free from risk as it is at the present day, "pronunciamientos" and Indian risings were not of uncommon occurrence, and Admiral Brine was fortunate in escaping any serious danger; but he, no doubt, principally owed his immunity from trouble to tact and good temper in his dealings with the Indians. He was usually indebted to the "padres" for hospitality on the road, and learnt from the priests themselves how independent the Indians had become in matters of religion.

> "'The Indians come and go as they please,' said Father Hernandez, 'light their own candles, hold their own services before the altar, and frequently take one of the saints out of the church, and carry it away to

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some hut, where for several days they will perform musical ceremonies before it, and then the saint will be brought back to its proper altar'—and again, 'they come from afar to make offerings of blossoms and leaves, light candles before the altars of those saints they wish to honour, and then silently return to their huts.'"

There can be little doubt that in pre-Christian times they were accustomed to an elaborate ritual, and it was partly for this reason that they took so readily to the ceremonies of the Roman Church, but they never quite abandoned their old beliefs. The twenty-four years that have elapsed since Admiral Brine's journey have not made much difference in this respect; and little rough altars may any day be found on the tops of abandoned temple mounds with the scent of incense still hanging about them.

Admiral Brine camped for a few days in the ruined temples at Palenque, and then travelled northwards to Yucatan and visited the ruins of Uxmal. The last two chapters give an interesting summary of the author's notes and the conclusions to which he has come. With these conclusions it is not always possible to agree; but that is not much to be wondered at, when dealing with a subject which is so closely enveloped in mystery as the civilisation and migrations of the races of America.

Happily we can feel assured that a distinct advance in our knowledge of the subject is being made, and that there is a fair prospect that, within the next few years, some at least of the mystery will be rolled away.

A good example of the very careful work which is being done by numerous scientific societies in America, in collecting and examining prehistoric remains, can be seen in Mr. Clarence B. Moore's account of his excavations in the sand mounds of the St. John's River in Florida, and Mr. W. H. Holmes's notes on the pottery from these mounds, which was submitted to him for examination, both published in the *Journal* of the Philadelphia Academy of Sciences.

The sand burial mounds occur frequently in the neighbourhood of large shell deposits. They are usually stratified, the layers consisting of different coloured sand, with sometimes a slight admixture of shell, and the human bones and other objects are most frequently found in a layer of sand of a pinkish colour, due to the presence of powdered hematite.

It is not unusual to find in Indian burial mounds pottery which has been purposely broken before burial, as though in observance of some ceremonial rite, but in these sand mounds Mr. Moore found mortuary pottery in which the breakage or perforation had been made before the pottery was fired.

With some of the surface and intrusive burials were associated iron and brass objects, showing them to have been post-Columbian; but nothing indicating contact with Europeans was found associated with the deeper interments, and many of the mounds were entirely free from evidence of contact with white men.

At Thursby Mound a number of very curious rough pottery figures were found, representing squirrels, turkeys, fish, turtles, &c., as well as some vegetal forms, which are extremely rare in the normal art of the United States. The illustrations which accompany these notes are numerous and excellent.

As we hear that Mr. W. H. Holmes, whose admirable work is so well known, is leaving the Bureau of Ethnology at Washington, in order to take charge of the new and liberally endowed museum at Chicago, which is the outcome of the great World's Fair, we may look for steady and increasing contributions to our knowledge of the Indian races and their arts, which will not be limited to the result of investigations in the territory of the United States, but will include the whole American continent.

The Peabody Institute of Massachusetts (principally owing to the liberal support afforded it by Mr. C. Bowditch, of Boston) has been able to set a good example in commencing systematic work on the central civilisations, by the investigations now being carried on at the ruins of Copan, the site of which has been acquired on lease from the Government of Honduras for a period of ten years. The Peabody Museum at Cambridge, with its fine collections of pottery, original sculpture and casts, is fast becoming a centre for the study of American antiquities.

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## *WATTS' DICTIONARY OF CHEMISTRY.*

*Watts' Dictionary of Chemistry.* Revised and entirely re-written. By M. M. Pattison Muir, M.A., and H. Forster Morley, M.A., D.Sc. Assisted by eminent contributors. Vol. IV. With Addenda. 8vo. Pp. 922. (London and New York: Longmans, Green, and Co., 1894.)

THE completion of the grand work before us renders it possible to form a fair estimate of its features and its general character. No candid reader can fail to appreciate the industry displayed by the editors and contributors, in bringing together and sifting out the vast mass of existing matter, in a science which is experiencing so rapid a growth. Perhaps a greater difficulty has been encountered in compressing within reasonable limits the facts which must claim insertion. This end has been reached by a style laudably laconic, but at the same time free from obscurity, and by an ingenious system of abbreviations, the editors—or we might better say the authors, since the entire work has been re-written—have confined themselves to the pure science, leaving its thousand and one applications in manufactures, metallurgy, and agriculture, to be dealt with in the "Dictionary of Applied Chemistry," issued by the same publishers. Without this limitation, the cost of producing the work would have been simply prohibitive.

Many of the articles included in this volume are, in their value and extent, almost worthy to rank as independent works. As instances we may mention the section on the Proteids; that on the Ptomaines—which might have been a little more extensive—the article on Phosphorus; and, above all, that on the Physical Methods used in Chemistry. This article, which extends to 100 pages, treats separately of methods based on capillarity, of crystallographic methods, of dialysis and diffusion, of dynamical methods, of electrical methods, of procedures based on the freezing-points of solutions, of optical methods, of methods based on osmotic pressure, of photographic methods, of methods turning on the specific

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